

Black Patients undergo Knee Replacement at a Younger Age and have Worse Outcomes than White Patients: A Retrospective Matched Cohort Study

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INTRODUCTION:

Introduction: Previous studies have shown that Black patients experience higher rates of post-operative complications. This study expands on that literature by investigating how race correlates with specific complications and total cost between Black and White patients following knee replacement. We hypothesized that Black patients would have higher rates of complications and cost, thus worse outcomes, than White patients.

METHODS:

Methods: Data were collected from a large commercial insurance database between the years 2015-2017. Patients who underwent a knee replacement were assigned under Current Procedural Terminology (CPT) and International Statistical Classification of Diseases (ICD-9/ICD-10) codes. Black and White patients were matched for age, gender, and tobacco use, diabetes, and obesity comorbidities. Standardized complications and total costs at one year were compared, before and after matching, using unequal variance t-tests.

RESULTS:

Results: 2570 Black patients (23% male) and 36415 White patients (37% male) underwent knee replacement. Black patients were 3.2 times more likely to have knee replacement done under age 65 ($p < 0.0001$) and more likely to undergo revision (OR=1.769 $p = 0.0016$). Black patients had significantly higher rates of acute kidney injury (AKI) (OR=1.848 $p < 0.0001$), wound complication (OR=1.624 $p = 0.0003$), deep vein thrombosis (OR=1.728 $p < 0.0001$), transfusion (OR=1.521 $p = 0.0152$), congestive heart failure (OR=1.355 $p = 0.02$), anemia (OR=1.351 $p = 0.007$), and pulmonary embolism (OR=1.713 $p = 0.0004$), and significantly lower rates of arrhythmia (OR=0.695 $p < 0.0001$). Black patients were charged 33% ($p < 0.0001$) more than White patients. Matching reduced each group to 2570 patients included. Black patients had significantly higher rates of AKI (OR=1.570 $p < 0.0001$) and anemia (OR=1.415 $p = 0.0353$), but significantly lower rates of arrhythmia (OR=0.742 $p = 0.0001$) and surgical site infection (OR=0.655 $p = 0.0023$), and were charged 24% more ($p < 0.0001$).

DISCUSSION AND CONCLUSION:

Conclusions: Black patients experienced significantly greater rates of complications and higher costs. Therefore, this study supports our hypothesis that Black patients have worse outcomes than White patients after knee replacement and advocates for reducing health disparities.